

Geosciences' teaching and students' interest in secondary schools - The case of Greece and Spain

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ABSTRACT

A research on Geosciences curricula of secondary school in European countries and topic preferences of students (Interest research) is carried out within the frame of the research project of EU- Long-life Learning Program: GEOschools. A Comparative analysis of Earth Sciences curricula has been carried out by a detail comparison of Educational programs in different European countries (Austria, Greece, Portugal, Italy and Spain), which are the partners of GEOschools project, in Secondary teaching levels, from 14 to 17 years. The Interest research analysis was made on the basis of a questionnaire designed as the main data-collection instrument and based on the results of a comparison on geosciences curricula among five European countries.

Preliminary results of the curriculum comparison research show big differences on what concerns the time and contents of geological subjects and concepts in secondary schools in different European countries, Portugal holding the highest values and Greece the lowest rates. The topic-interest research on geosciences was carried out in different schools of the partner countries among 14 to 17 year-old school students. The questionnaires were distributed in 20 schools (20 teachers and around 600 students) in each participating country in order to identify existing geosciences interest.

Results indicate that the most attractive topics for children are Natural hazards and Palaeontology. Teaching strategies also raise high interest as a topic they feel concerned with. Children from Spain have less interest in geosciences generally than do children of the same age from Greece.

INTRODUCTION

Although the knowledge of geosciences is important in everyday life of all European citizens, in most European countries Geology does not exist as a separate subject in secondary education. Geology is included, indirectly, through other subjects such as Education for environment and sustainable development.

A research based on the review of the geological contents of curricula in schools from Greece and Spain was organized by GEOschools project in order to investigate the level of geosciences teaching in secondary schools (Fermeli et al, 2011a; Fermeli et al, 2011b).

Curriculum research

Two approaches can be recognized: a) The «Horizontal approach» which is the classic of Natural Sciences, where a subject includes several scientific disciplines: Biology (the most relevant), Geology or Earth Sciences, Chemistry and Physics, this is the case in Spain and b) a «Vertical approach», the case of Greece, where Geology is included with Geography, which is closely related (Table 1; see: Calonge, 2011; 2012).

At the higher secondary level some countries, such as Portugal, hold an important presence of Geology in school curricula of Secondary Schools. But in most European

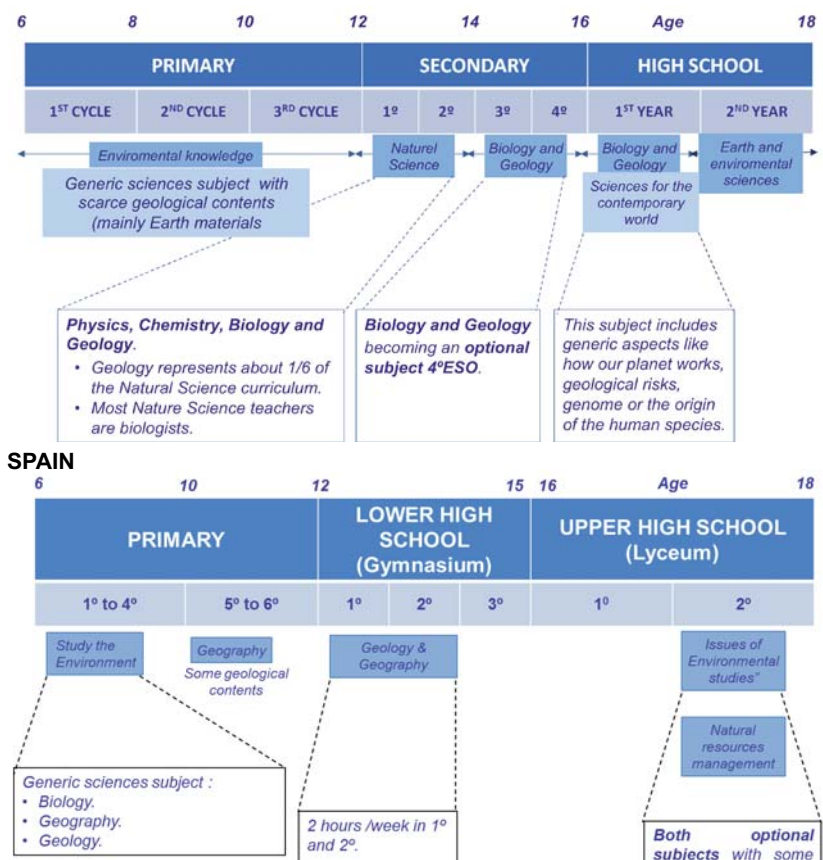


Table 1: General view of geosciences subjects in obligatory education and upper high school in Spain and Greece (Calonge, 2011; 2012).

countries, the geological concepts are distributed in other disciplines vaguely related. Specifically, in Spanish educational system geology exists in Upper High school however it is excluded from the university access tests, and in Greek educational system it is totally absent in the upper cycle of Secondary Teaching.

INTEREST RESEARCH

Why is the presence of geosciences subjects in secondary schools curricula so limited? Are students interested in these subjects? Do students recognize the importance of the knowledge of geosciences in everyday life?

An interest research study was organized among 700 secondary school students from Greece and Spain by a series of specific questionnaires, in order to investigate their interest in natural sciences and, more precisely, in specific subjects of geosciences. Results indicate that the most attractive topics for children are Natural hazards and Palaeontology, dinosaurs occupying a prominent place within preferences. Teaching strategies and educational innovative techniques also raise high interest. Children from Spain have less interest in geosciences generally than do children of the same age from Greece.

This research showed that Greek students rated with the same score biology and physics followed by geology and chemistry in the same rate and Spanish students showed a higher interest on biology, followed by chemistry, physics and geology (Table 2).

Greek students would like to have a Geology subject in the school at 68,6% but only 22,9% would think about studying Geology in the university. They instead recognize in 78,2% that geology is useful for other scientists and technicians (engineers, biologists, conservationists etc.) and they accept in 73,8% that basic geological knowledge is useful for everyday life of people. Spanish students in turn, are less inclined to have a Geology subject in the school (32,9%) and only 15,6% would like to study Geology in the university. However, they also recognize in high percentage (75,5%) that geology is useful for other scientists and technicians (engineers, biologists, conservationists etc.) and accept in 66,5% that basic geological knowledge is useful for everyday life of people. Concerning the general interest in geosciences, this is confirmed by students from both Greece and Spain. The most interesting subjects in total score for students from both countries are "Natural hazards" and "Palaeontology" and the less interesting "The measure of time" and "Geological maps". Both groups give a high rate to "Teaching strategies".

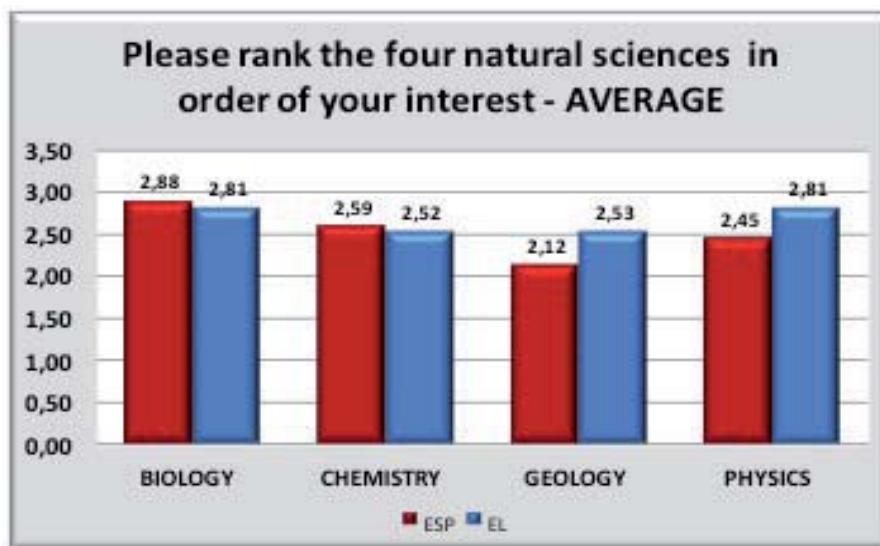


Table 2: Natural sciences interest for Spanish (ESP) and Greek (EL) secondary school students.

CONCLUSIONS

The progressive decrease of the amount of Geology being taught in schools, both in time assigned and in contents' share in science programs, could bring highly negative consequences to the university background and future research and knowledge of Earth.

The interest research of GEOschools showed the general interest of students in geosciences both in Greece and Spain. The high interest of students in some specific geosciences topics should perhaps make us think on the convenience to drive the curricula contents and teaching strategies towards these "interest topics" rather than trying to follow a perhaps excessively rigid, or academic, development of teaching programs.

The ultimate goal of this research is to find effective ways of engaging students in a new learning approach, and placing Geology at the same level of other sciences in secondary school programmes. The challenge, perhaps, would be how to combine a good structural and conceptual teaching of Earth Sciences with permanent links to attractive interesting topics, i.e. making Earth Sciences something present and related to daily life.

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